REMARKS

In the outstanding final rejection, the Examiner cited Webbere, U.S. Patent 2,770,860 to show the use of a deoxidizing compound. Applicants have previously argued that this reference does not teach a deoxidizing compound which removes an oxide film from molten metal, but instead merely acts does a "non-oxidizing atmosphere".

In order to support this argument, Applicants are submitting herewith three documents, two of which are in the Japanese language, for which partial translations have been provided. These documents help to understand the properties of dichlorodifluoromethane (CCl_2F_2). At column 3, line 26 of the reference, the dichlorodifluoromethane is said to be a reactive gas at the temperature of the melt and that the chlorine and the fluorine form a flux. Thus, this apparently discusses the thermal decomposition of the dichlorodifluoromethane into chlorine and fluorine by the heat of the molten aluminum. Thus, the Examiner states that this reference discloses a casting method including the steps of having a deoxidizing agent in the cavity of the casting die and pouring the molten metal in the cavity.

However, it is known that the melting point of aluminum is 660.2°C and the temperature of the molten aluminum is normally a maximum of 750°C.

The first of three attached documents is Japanese Patent Gazette No. 3-51611. This first document indicates that the pyrolysis of dichlorodifluoromethane is executed with an endothermic reaction of ΔH= +114.0 Kcal/mol. Thus, this reaction does not progress without supplying heat from outside. Further, this reference also indicates that the required calorific value of the pyrolysis is greater than a required calorific value of oxidization (ΔH= +19.9 Kcal/mol), as is also described in the first document.

However, according to the Dictionary of Environmental Technology, which is the second document of the three, thermal decomposition corresponding to oxidization occurs at 900°C as discussed in "liquid injection" of "incineration, combustion" (pages 690-691). Since the required calorific value of progressing the oxidization is less than that of the pyrolysis of the material, and since the reaction temperature of the oxidization is 900°C or more, it is clear that the temperature of pyrolyzing the material is higher than 900°C. Accordingly, it is clear that the dichlorodifluoromethane material is not pyrolized in the situation described in the Webbere reference where the material contacts molten aluminum whose temperature is only 750°C or so.

Even if the material is thermal-decomposed into chlorine and fluorine, since an oxide film formed on a surface of the molten aluminum is alumina, which is chemically stable, it will not react

with chlorine or fluorine, whether they are thermal-decomposed or pyrolyzed.

As described in Nikkin Flux, the third of the three documents, a fluorine flux is used in the field of aluminum casting. However, the flux used for aluminum casting covers a surface of molten aluminum so as not to contact with oxygen, so that the formation of the oxide film can be restricted. Therefore, the purpose of placing dichlorodifluoromethane, which is heavier than air, in a cavity of a casting die, such as disclosed in the Webbere reference, is to prevent oxygen from invading the cavity. Thus, the oxide film can be restricted.

However, it is clear that the Webbere reference does not disclose a deoxidizing agent which can deoxidize an oxide film already formed on the surface of the molten metal at all.

Applicants also wish to point out column 3, lines 26-28 which discusses the formation of the flux. It states there that it renders any film on the surface of the melt less subject to rupture and fragmentation during pouring. This statement may refer to the discussion at column 1, lines 28-35 which discusses how the oxide film often makes the casting imperfect due to entrapment of the film in the cast metal. Thus, the presence of the chlorine and fluorine as a flux may be used merely to prevent an existing film from rupturing and becoming entrapped within the metal, as opposed to merely staying on the surface. Thus, the purpose of such a flux

is not to deoxidize the film, but merely to prevent it from breaking up and becoming physically mixed in with the pure molten metal. In view of this, Applicants submit that there is no teaching of a deoxidizing compound at all in this reference.

Furthermore, in regard to the Schekhter et al. reference, it is pointed out again that this reference utilizes a magnesium gas rather than a magnesium nitride compound. Since claim 10 specifically describes the deoxidizing compound as a magnesium nitride compound formed by reacting magnesium gas on nitrogen gas, it does not seem that the use of this teaching is helpful at all. The claim described a specific compound and even describes how it is made, which is different than the magnesium gas described in Schekhter et al. Even if magnesium gas can be used for a similar purpose, it is not the compound mentioned in the claim. It would not be obvious there over without a teaching reference that the two are equivalent. Accordingly, Applicants submit that the use of this reference is also in error. Furthermore, in regard to the dependent claims, Applicants note that the Examiner has not indicated where in the references these various features are seen. Accordingly, should the Examiner again reject these claims, he is requested to point out where the various features of the dependent claims are found in the references.

In view of the above comments, Applicants submit that the application is now in condition for examination. An early and favorable action is respectfully requested.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert F. Grnuse (Reg. No. 27,295) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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0038-0358P
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Attachment(s): Document 1 - Japanese Patent Gazette No. 3-51611
With partial English translation
Document 2 - Dictionary of Environmental Technology
Pages 690-691
Document 3 - Nikkin Flux